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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/854,611	05/14/2001	M. James Grieve	DP-302895	4829

7590

09/16/2003

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EXAMINER

WINTER, GENTLE E

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/854,611

Applicant(s)

GRIEVE ET AL.

Examiner

Gentle E. Winter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 7-18 and 21-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-3, 18 and 19 drawn to a method of using a diesel reforming strategy, classified in class 429, subclass 12.
 - II. Claim 7 and 8, drawn to a method of making an apparatus for a diesel reforming strategy, classified in class 202, subclass 82.
 - III. Claims 9-11 and 20-22, drawn to a method of using a fuel cell system, classified in class 429, subclass 19.
 - IV. Claims 12-17, drawn to, a fuel cell system for diesel fuel reforming, classified in class 202, subclass 110.
 - V. Claim 23-25, drawn to a fuel cell system, classified in class 429, subclass 34.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are not disclosed as capable of use together and they have different modes of operation.
3. Inventions I & II and III-V are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the

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process as claimed can be practiced by another materially different apparatus or by hand, specifically through molecular sieve and cracker.

4. Inventions III-V are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are not disclosed as capable of use together and they have different modes of operation.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Pamela J. Curbelo on 9/5/03 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-3, 18 and 19.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 4-17 and 20-25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

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8. It is noted that, upon a finding of the pending claims being allowable, this examiner will look to see if any of the withdrawn claims are also allowable, such that all allowable claims may be allowed.

Oath/Declaration

9. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because it has not been signed by two of the inventors, namely Grieve and DeMinco.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by the reference “How Oil Refining Works” (HSW)

Claim 1 recites a method comprising the steps of supplying Diesel fuel to a fractional distillation device in fluid communication with a reformer, wherein the Diesel fuel consists essentially of compounds having a carbon number of about C8 to about C20, fractionally distilling said Diesel fuel to produce a light fuel stream and heavy fuel stream; and reforming the light fuel stream in

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said reformer to produce a reformat. Figure 3, page 8 of HSW discloses a fractional distillation device (distillation column) in fluid communication with a reformer (at the "Naphtha" stream), wherein the Diesel fuel consists essentially of compounds having a carbon number of about C8 to about C20, fractionally distilling said Diesel fuel to produce a light fuel stream (Naphtha) and heavy fuel stream; and reforming the light fuel stream in said reformer to produce a reformat (the post reformer stock is, by definition, a reformat).

Claim 2 indicates that the heavy fuel stream is burned in a burner to generate thermal energy.

Diesel distillate is disclosed to be used as heating oil. See page 3.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 19 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over HSW and United States Patent No. 4,522,894 to Hwang et al. Each and every limitation of claims 19 and 3 is identically disclosed in HSW as set forth above; except that HSW fails to explicitly disclose an endothermic steam reformer. The same is believed inherent in the reference to the production of hydrogen at page 7 of HSW, however to be rigorous, Hwang discloses the missing element and explicitly provides the motivation for making the claimed combination. Specifically, Hwang discloses "a fuel cell power plant" that includes an "autothermal reformer" for on-site generation of the hydrogen-rich fuel supplied to the fuel cell stack. The autothermal

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reformer includes a second catalytic zone for carrying out steam reforming, an endothermic reaction. See e.g. column 5, line 14 *et seq.* The artisan would have been motivated to make the instant combination for the reasons explicitly set forth in Hwang, namely for the for on-site generation of the hydrogen-rich fuel supplied to the fuel cell stack.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. United States Patent No. 6,348,278 to LaPierre et al. discloses a method and system for supplying hydrogen for use in fuel cells. LaPierre, in discussing the prior art of record discloses that U.S. Pat. No. 5,686,196 to Singh et al. discloses a system for operating a solid oxide fuel cell generator using diesel fuel. The reformer produces hydrogen from the reforming reaction of desulfurized diesel fuel. The hydrogen produced is separated from the other reforming reaction products and is sent to a hydrogen storage device or is mixed with the diesel fuel prior to desulfurization. The remaining reaction products from the reforming reaction are fed to a solid oxide fuel cell where water generated from the operation of the fuel cell is recycled back to the reforming reactor. The system in Singh, although recycling some streams, is disclosed as being sub-optimal in that the reactant by-products produced in the system could "be used more efficiently to supply heat and energy to other system members." LaPierre goes on to indicate that the LaPierre invention "provides a method and system for efficiently producing hydrogen that can be supplied to a fuel cell. The method and system of the present invention produces hydrogen in a reforming reactor using a hydrocarbon stream... The purified hydrogen can then be fed to a fuel cell where electrical energy is produced... In another embodiment, a

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combustor is provided for combusting a second portion of the retentate stream to provide heat to the reforming reaction or other reactants. ... Thus, the system and method of the present invention advantageously uses products generated from the system to enhance the overall efficiency of the system.

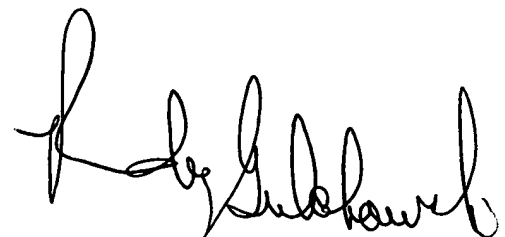
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. The direct fax number for this examiner is (703) 746-7746.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter
Examiner
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September 8, 2003

A handwritten signature in black ink, appearing to read 'Randy Gulakowski', is written over a faint, larger signature that appears to be 'Gentle E. Winter'.

RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700